

### Amendments to the Claims

Please amend claims 1, 15, 26, 33 and add new claims 37 and 38 as indicated below. All claims are listed below, with currently amended claims so marked. This listing of claims will replace all prior versions, and listings, of claims in the application:

- 1           1.     (Currently Amended)     A method of processing a video stream,  
2 comprising:  
3           (a) detecting a request to randomly access a particular frame;  
4           (b) maintaining a list of frame dependencies identifying at least a set of frames  
5 required to decode the particular frame; and  
6           (c) determining based at least in part on the list of frame dependencies whether  
7 a decoded version of the particular frame is in a decoded frame cache, said cache  
8 configured to store an arbitrary number of previously decoded frames, and if it is not  
9 and if the particular frame has a frame dependency:  
10           (i) determining a frame dependency for the particular frame;  
11           (ii) determining which of the frames in the frame dependency are in the  
12 decoded frame cache;  
13           (iii) decoding any frame in the frame dependency that is not in the  
14 decoded frame cache and placing it in the decoded frame cache; and  
15           (iv) using at least one of the decoded frames in the frame dependency to  
16 decode the particular frame to create a decoded version of the particular frame.
- 17           2.     (Previously Presented)     The method of claim 1, wherein the request to  
18 playback a particular frame is part of a request to perform frame-by-frame backward  
19 playback and part (c) is performed for successively earlier frames with respect to the  
20 particular frame as part of the frame-by-frame backward playback.

1           3.     (Original)     The method of claim 1, wherein part (i) is performed whether  
2     or not it is determined that a decoded version of a particular frame is in the decoded  
3     frame cache without part (iv) being performed.

4           4.     (Original)     The method of claim 1, wherein the particular frame may be  
5     an I, P, or B frame of MPEG compressed video.

6           5.     (Original)     The method of claim 1, wherein the frame dependency is an  
7     immediate frame dependency.

8           6.     (Previously Presented)     The method of claim 5, wherein the at least  
9     some of the decoded frames referred to in part (iv) are those frames in the immediate  
10    dependency.

11          7.     (Previously Presented)     The method of claim 5, wherein part (c)  
12    includes recursion where frames in the immediate frame dependency of the frame of  
13    interest are not in the decoded frame cache.

14          8.     (Previously Presented)     The method of claim 1, wherein part (c)  
15    includes a loop with a terminating condition that all frames on which the particular frame  
16    is dependent have been decoded.

17          9.     (Original)     The method of claim 1, wherein decoded frames are  
18    replaced in the decoded frame cache according to a least recently used policy.

19          10.    (Original)     The method of claim 1, wherein an index is used to  
20    represent each frame in the frame dependency.

21          11.    (Original)     The method of claim 1, wherein the frame dependency is  
22    determined through a look-up table.

1           12.   (Original)    The method of claim 11, wherein the frame dependency is  
2   determined through successive uses of a look-up table.

3           13.   (Original)    The method of claim 1, wherein the decoded frame cache  
4   includes a data structure.

5           14.   (Original)    The method of claim 1, wherein the decoded frame cache  
6   includes a section of main memory.

7           15.   (Currently Amended)    An article comprising:  
8           a computer readable medium having instructions thereon which when executed  
9   cause a computer to:  
10           (a) detect a request to randomly access a particular frame; and  
11           (b) maintaining a list of frame dependencies identifying at least a set of frames  
12   required to decode the particular frame;  
13           (c) determine base at least in part on the list of frame dependencies whether a  
14   decoded version of the particular frame is in a decoded frame cache, said cache  
15   configured to store an arbitrary number of previously decoded frames, and if it is not  
16   and if the particular frame has a frame dependency:  
17           (i) determine a frame dependency for the particular frame;  
18           (ii) determine which of the frames in the frame dependency are in the  
19   decoded frame cache;  
20           (iii) decode any frame in the frame dependency that is not in the decoded  
21   frame cache and place it in the decoded frame cache; and  
22           (iv) use at least and of the decoded frames in the frame dependency to  
23   decode the particular frame to create a decoded version of the particular frame.

24           16.   (Previously Presented)    The article of claim 15, wherein the request to  
25   playback a particular frame is part of a request to perform frame-by-frame backward

1 playback and part (c) is performed for successively earlier frames with respect to the  
2 particular frame as part of the frame-by-frame backward playback.

3 17. (Original) The article of claim 15, wherein part (i) is performed whether  
4 or not it is determined that a decoded version of a particular frame is in the decoded  
5 frame cache without part (iv) being performed.

6 18. (Original) The article of claim 15, wherein the frame dependency is an  
7 immediate frame dependency.

8 19. (Previously Presented) The article of claim 18, wherein the at least  
9 some of the decoded frames referred to in part (iv) are those frames in the immediate  
10 dependency.

11 20. (Previously Presented) The article of claim 18, wherein part (c)  
12 includes recursion where frames in the immediate frame dependency of the frame of  
13 interest are not in the decoded frame cache.

14 21. (Previously Presented) The article of claim 15, wherein part (c)  
15 includes a loop with a terminating condition that all frames on which the particular frame  
16 is dependent have been decoded.

17 22. (Original) The article of claim 15, wherein decoded frames are  
18 replaced in the decoded frame cache according to a least recently used policy.

19 23. (Original) The article of claim 15, wherein an index is used to represent  
20 each frame in the frame dependency.

21 24. (Original) The article of claim 15, wherein the frame dependency is  
22 determined through a look-up table.

1           25.   (Original)    The article of claim 24, wherein the frame dependency is  
2   determined through successive uses of a look-up table.

3           26.   (Currently Amended)    A computer system including:  
4   a processor and video processing circuitry;  
5   a display; and  
6   memory including instructions which when executed cause the processor and  
7   video processing circuitry to:

8           (a) detect a request to randomly access a particular frame; and

9           (b) maintain a list of frame dependencies identifying at least a set of frames  
10   required to decode the particular frame;

11           (c) determine whether a decoded version of the particular frame is in a decoded  
12   frame cache, said cache configured to store an arbitrary number of previously decoded  
13   frames, and if it is not and if the particular frame has a frame dependency:

14                   (i) determine a frame dependency for the particular frame;

15                   (ii) determine which of the frames in the frame dependency are in the  
16   decoded frame cache;

17                   (iii) decode any frame in the frame dependency that is not in the decoded  
18   frame cache and place it in the decoded frame cache; and

19                   (iv) use at least and of the decoded frames in the frame dependency to  
20   decode the particular frame to create a decoded version of the particular frame.

21           (d) provide the decoded version of the particular frame for displaying on the  
22   display.

23           27.   (Previously Presented)    A method for randomly accessing a first frame  
24   of a video stream, comprising:

25           maintaining a list of frame dependencies identifying at least a set of frames  
26   required to decode the first frame;

27           determining a decoding of the first frame is not in a decoded frame cache;

1 determining, based at least in part on the list of frame dependencies, a first frame  
2 dependency for the first frame comprising frames required to decode the first frame;  
3 decoding at least one of the frames of the frame dependency not present in the  
4 decoded frame cache, and placing it in the decoded frame cache; and  
5 decoding the first frame using at least one of the decoded frames in the decoded  
6 frame cache.

7 28. (Original) The method of claim 27, further comprising:  
8 decoding each frame of the frame dependency not present in the decoded frame  
9 cache, and placing them in the decoded frame cache.

10 29. (Original) The method of claim 27, further comprising:  
11 recursively decoding the second frame of the frame dependency.

12 30. (Original) A method according to claim 27 for reverse playback of  
13 frames of the video stream, comprising:  
14 determining a second frame is not in the decoded frame cache, the second frame  
15 following the first frame in the video stream;  
16 determining a second frame dependency for the second frame comprising  
17 frames required to decode the second frame;  
18 decoding at least one of the frames of the frame dependency not present in the  
19 decoded frame cache, and placing it in the decoded frame cache; and  
20 decoding the second frame using at least one of the decoded frames in the  
21 decoded frame cache.

22 31. (Original) The method of claim 30, further comprising:  
23 playing the second frame and then the first frame.

24 32. (Original) The method of claim 30, wherein the second frame is an  
25 immediately following frame of the first frame.

1  
2           33.   (Currently Amended)       An article comprising a machine-accessible  
3 media having associated data for randomly accessing a first frame of a video stream,  
4 wherein the data, when accessed, results in a machine performing:  
5           maintaining a list of frame dependencies identifying at least a set of frames  
6 required to decode the first frame;  
7           determining a decoding of the first frame is not in a decoded frame cache, said  
8 cache configured to store an arbitrary number of previously decoded frames;  
9           determining, based at least in part on the list of frame dependencies, a first frame  
10 dependency for the first frame comprising frames required to decode the first frame;  
11           decoding at least one of the frames of the frame dependency not present in the  
12 decoded frame cache, and placing it in the decoded frame cache; and  
13           decoding the first frame using at least one of the decoded frames in the decoded  
14 frame cache.

15           34.   (Original)     The article of claim 33 wherein the machine-accessible  
16 media further includes data, when accessed, results in the machine performing:  
17           decoding each frame of the frame dependency not present in the decoded frame  
18 cache, and placing them in the decoded frame cache.

19           35.   (Original)     The article of claim 33 wherein the machine-accessible  
20 media further includes data, when accessed, results in the machine performing:  
21           recursively decoding the second frame of the frame dependency.

22           36.   (Original)     The article of claim 33 wherein the machine-accessible  
23 media further includes data for reverse playback of frames of the video stream, when  
24 accessed, results in the machine performing:  
25           determining a second frame is not in the decoded frame cache, the second frame  
26 following the first frame in the video stream;

1 determining a second frame dependency for the second frame comprising  
2 frames required to decode the second frame;  
3 decoding at least one of the frames of the frame dependency not present in the  
4 decoded frame cache, and placing it in the decoded frame cache; and  
5 decoding the second frame using at least one of the decoded frames in the  
6 decoded frame cache.

7 37. (New) A method of caching decoded frames of a video in a decoded  
8 frame cache configured to store an arbitrary number of previously decoded frames,  
9 comprising:  
10 maintaining a list of frame dependencies identifying at least a set of frames  
11 required to decode a particular frame of the video;  
12 determining based at least in part on the list of frame dependencies that a  
13 decoded version of the particular frame is not in the decoded frame cache; and  
14 determining if the particular frame has a frame dependency, and if so:  
15 determining a frame dependency for the particular frame,  
16 determining which of the frames in the frame dependency are in the  
17 decoded frame cache,  
18 decoding any frame in the frame dependency that is not in the decoded  
19 frame cache and placing it in the decoded frame cache, and  
20 using at least one of the decoded frames in the frame dependency to  
21 decode the particular frame to create a decoded version of the particular frame.

22 38. (New) The method of claim 37, further comprising:  
23 detecting a request to randomly access the particular frame;  
24 wherein the request to playback the particular frame is part of a request to  
25 perform frame-by-frame backward playback.